



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,396	01/16/2004	Ryoichi Kajiware	503.38097CX1	6074

20457 7590 02/09/2005

ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-9889

EXAMINER

CHAMBLISS, ALONZO

ART UNIT	PAPER NUMBER
----------	--------------

2814

DATE MAILED: 02/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary

Application No.

10/758,396

Applicant(s)

KAJIWARA ET AL.

Examiner

Alonzo Chambliss

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 2 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/493,080.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/16/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 09/493,080, filed on 1/28/00. **Information Disclosure Statement**
2. The information disclosure statement (IDS) submitted on 1/16/04 was filed before the mailing date of the non-final rejection on 2/6/05. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

3. The formal drawings filed on 1/16/04 have been approved by the examiner.

Specification

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested: " SEMICONDUCTOR CHIP ATTACHED TO A SUBSTRATE UTILIZING COMPOSITE METAL LAYERS ".

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasem et al. (U.S. 6,249,041) in view of Nakamura (JP 1-266752) and Osawa et al. (U.S. 6,077,727).

With respect to Claims 1 and 2, Kasem discloses a semiconductor substrate 12 (i.e. chip) and a semiconductor element (i.e. chip) which comprises the semiconductor substrate 12. Kasem discloses a semiconductor element attached to a first metallic member 26 (i.e. lead) and a second metallic member 32 (i.e. lead) by solder bumps in an alternative embodiment (see col. 4 lines 10-20, Figs. 1A and 1B). Kasem does not explicitly disclose a first and second electrodes provided on a front and rear planes of the chip. However, since solder bumps are used in the alternate

Art Unit: 2814

embodiment on the front and rear planes. It is well known in the semiconductor industry to connect Au solder bumps to Al electrode pads as evident by Nakamura (see Figs. 1-3). Thus, the first metallic member 26 is connected to the first electrode and a second metallic electrode 32 is connected to the second electrode. The second electrode is connected to the second metallic member 32 via a metallic layer (i.e. bumps). Kasem fails to disclose second electrode that is connected to the second metallic member via a metallic layer containing precious metal, wherein the metal layer is a composite metal layer comprised of a first precious metal layer provided at the front plane of the second electrode and a second precious metal layer adhered thereto by compression bonding provided at the front plane of the second metallic member. However, Osawa discloses an electrode 2 that is connected to the metallic member 14 via a metallic layer 23 containing precious metal, wherein the metal layer 23 is a composite metal layer comprised of a first precious metal layer 23a provided at the front plane of the electrode 2 and a second precious metal layer 23c adhered thereto by compression bonding provided at the front plane of the metallic member 14 (see col. 4 lines 37-67 and col. 5 lines 1-20, Figs. 4 and 5A-5E). Thus, at least 80% of an area of a respective Au/Al bonding region is contacting a Au bump, wherein the bonding region is made of an Au/Al alloy layer in the thickness direction. Therefore, it would have been obvious to incorporate the composite metal layer to the metallic member, since the composite metal layer would improve the electrical connection between the metallic member and a bump as taught by Osawa.


The prior art made of record and not relied upon is cited primarily to show the product of the instant invention.

Conclusion

7. Any inquiry concerning the communication or earlier communications from the examiner should be directed to Alonzo Chambliss whose telephone number is (571) 272-1927.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-7956

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system Status information for published applications may be obtained from either Private PMR or Public PMR. Status information for unpublished applications is available through Private PMR only. For more information about the PMR system see <http://pair-dkect.uspto.gov>. Should you have questions on access to the Private PMR system contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or EBC_Support@uspto.gov.

A handwritten signature in black ink, appearing to read 'Alonzo Chambliss', is positioned above the printed name and title.

Alonzo Chambliss
Primary Patent Examiner
Art Unit 2814

AC/February 6, 2005